## PHIKS - Physical Inspection and attacks on electronicS

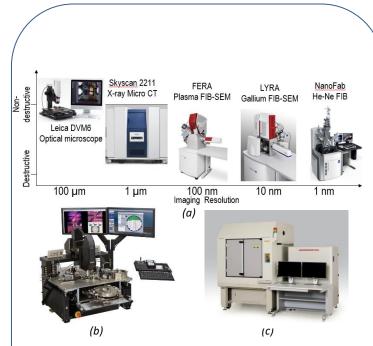
### **Challenge:**

- Workforce development and education for future generation of engineers in hardware security
- Lack of material for physical assurance for training

#### **Solution:**

 PHIKS have collected considerable amount of material from various physical modalities for electronics hardware assurance

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Advanced capabilities: Physical inspection equipment includes (a) Bruker Skyscan 2211 X-ray Micro CT, TESCAN FERA and LYRA SEM-FIB systems, and ZEISS ORION Nanofab; Soon to be added systems including (b) Cascade Summit micro-probe station; (c) HAMAMATSU Phemos-1000

#### **Scientific Impact:**

- Various physical modalities including but not limited to X-ray, SEM, PEM, THz, optical are collected from chips and printed circuit boards
- Such data are analyzed and made available for academia to use for training and education purposes in physical assurance.

# Broader Impact and Broader Participation:

- Generating education course slides
- Benefit to the security, failure analysis, and testing communities.
- Benefit to the industry and connecting students with the industry advisors for the course.